

THE BIOLOGICAL PHYSICIST

The Newsletter of the Division of Biological Physics of the American Physical Society

Vol 8 No 1 Apr 2008

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Take a break from grading final exams to enjoy the latest issue of THE BIOLOGICAL PHYSICIST. This issue brings you a feature interview with NSF Program Director Krastan Blagoev, as well as updates about the *Physical Review* journals from Senior Assistant Editor Margaret Foster, and the minutes of the DBP Business Meeting. Of course, we bring you all the usual suspects as well – job ads, and PRE and PRL highlights. Enjoy!

– SB

FEATURE

The Physics of Living Systems: An Interview with Krastan Blagoev

S. Bahar

Krastan B. Blagoev is Program Director at the National Science Foundation's Program on the Physics of Living Systems (formerly the Program on Biological Physics). Dr. Blagoev spoke recently with THE BIOLOGICAL PHYSICIST about the NSF program and its impact on interdisciplinary science.

The Biological Physics Program at NSF was founded recently. Describe the history of the Program.

“Biological Physics” was founded by Dr. Denise Caldwell in response to the bio-related proposals from the physics community submitted to the Physics Division. Previously, research related to biology was funded through the Education and Interdisciplinary Research program, but the strong involvement of the physics community in biology beginning in the 90's saw a need for a distinct program.

What led to the decision to rename the Program "Physics of Living Systems"?

In 2007, the number of proposals doubled compared to the number of proposals submitted in 2006. The proposals that we received could be classified in two categories: 1. *in vitro* molecular systems and 2. Living systems: cells, tissues, organs, populations of bacteria etc. The first category of proposals strongly overlapped with the category of proposals submitted to the Molecular Biophysics program in the Division of

Molecular and Cell Biology. On the other hand, the second category consisted of proposals that would have had a hard time identifying appropriate program support at the Foundation. This led us to the decision to evolve the Biological Physics program into Physics of Living Systems. The new program does not abandon *in vitro* research, but it will fund such research when it is related to living systems by co-reviewing and co-funding proposals with Biophysics. We feel that the Molecular Biophysics program is the intellectual place for some of these proposals.

Why do you think the new name better represents the Program's mission?

I think that the new name and scope reflect more explicitly our goal of giving priority to proposals that will enrich physics as a discipline. Biology has a lot to offer to physics. New physics concepts will have to be introduced to understand life and its beginning at multiple scales of organization, just as the study of condensed matter systems brought so many new concepts to physics.

Are there areas of biological physics that would not be appropriate for "Physics of Living Systems"?

To my mind, only projects that are unrelated to a living system would be inappropriate for the program!

How do you see the program changing in the future?

Physics has been on the forefront of science for a long time. Our goal is to stimulate the most advanced physics ideas and techniques and this means that the program priorities will have to evolve, but it is for the research community to decide in which direction to go.

How many proposals do you typically receive during each year? Has the number been increasing?

Last year the number of proposals that were reviewed was 108 of which 18, were career proposals. This was roughly two times the number of proposals reviewed in 2006.

How does your budget compare to that of NSF overall?

The current budget of the program is \$4.7 million per year. In comparison Molecular Biophysics has around \$14 million. "Physics of Living Systems" is a major new research direction in the Physics Division. Funding of research at the interface between the physical and biological sciences is a priority for the Mathematical and Physical Sciences directorate, as illustrated in the FY09 budget request by the Foundation. So I think that the program will grow, provided that there aren't any big surprises in the overall NSF budget.

What thoughts do you have about changing trends in interdisciplinary science?

My biggest concern is that it is very hard for young investigators to work on interdisciplinary problems. When a young faculty working on a biological problem at a physics department applies for tenure she or he is judged as a physicist. There is a high risk for this faculty member to be labeled as a biologist and denied tenure. This is why many

researchers who were fascinated by biology waited first to obtain their tenure and then moved to a new area of research. I hope that our program will send a message to the universities that there is physics in biology. I am optimistic that the Physics Departments will change their attitude, because to a large degree this transition has happened in Mathematics.

Can you tell me something about your own scientific background, and how this led you to your current position?

I obtained a Ph.D. degree in 1998 from Boston College in theoretical condensed matter physics. I worked on strongly correlated electron systems: Luttinger liquids, superconducting-ferromagnetic metals, double electron layers. After two post doc positions, one at the Cavendish Laboratory in Cambridge and one at the Harvard Medical School, I joined in 2002 the Los Alamos National Laboratory as a staff member. There my research focused on problems in brain imaging as well as on DNA dynamics and repair and telomere evolution in cancer and aging. I had very little understanding of experimental molecular cell biology so I spent 3 years in a molecular cell biology lab in the Biosciences Division at LANL doing fluorescent hybridization experiments. My current focus is on a theory of telomere-telomerase interaction and telomere dynamics in cancer.

Do you find many people who submit "NIH-like" proposals to "Physics of Living Systems"? Or do most researchers have a clear understanding of the difference between the goals of NIH and NSF?

We had few "NIH-like", "disease" related proposals. My limited experience is that the majority of PIs clearly understand the difference between the more applied NIH proposals, containing a lot of "preliminary"

data, and the basic science oriented NSF proposals.

What advice do you have for interdisciplinary scientists who are interested in submitting a proposal to "Physics of Living Systems"?

It is hard to give generic advice. One thing that is important is that when someone looks at the proposal she or he thinks: "This is physics". The application of a physical instrument to a biological system, does not transform the proposal into a physics proposal. Very important are the questions that are being addressed. Our goal is to fund the most advanced research projects, so my advice to

the scientists interested in the program is to bring their most innovative, albeit risky ideas to us. I also encourage researchers that are considering the program to contact me and discuss their plans. I work actively with program directors across different divisions and directorates at NSF and I will be happy supply the necessary information on different funding opportunities at the Foundation. My last advice for everyone is to develop well the broader impact of their proposals in terms of education and impact on society.

For more information, contact Dr. Blagoev at (703) 292 4666, or visit http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6673&org=PHY

FEATURE

What's New for Physical Review

By Margaret Foster

Senior Assistant Editor, PRE & PRA

You have probably noticed the new look of the APS journals website. All the Physical Review journals are celebrating 50 years of Physical Review Letters this year. On the journal homepages you find an image and link for a timeline featuring events related to the journals and seminal developments in physics after 1893. You also find an image and link for the most recent article featured in Physical Review Focus. Visually attractive images from recently published papers may also be selected to display in a Kaleidoscope on the journal homepage. Kaleidoscope images began to be featured in March this year for PRB. Watch for Kaleidoscope images to be displayed soon for PRA and PRE.

Other initiatives, such as RSS feeds and a new publication to "highlight the best physics," should help readers locate articles of interest in our rapidly growing journals. Topical cross-journal, as well as journal, RSS feeds are now available from <http://feeds.aps.org/>. There are plans to launch a new publication in order to highlight outstanding articles published in Physical Review and Physical Review Letters. Approximately 100 articles will be selected each year, and commentaries and subject overviews will also be provided. The projected launch date for this online publication is in the fall of 2008.

As a way of saying “Thank you” to the referees who contribute their time and

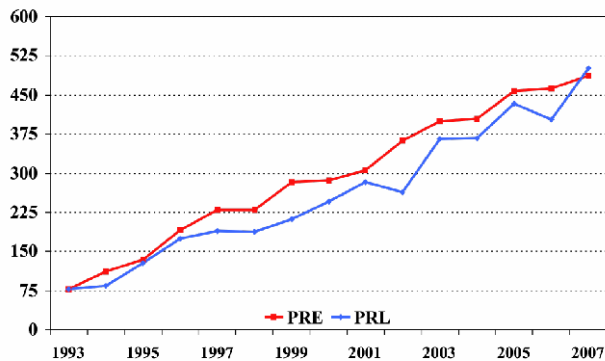


Fig. 1: Yearly number of biological physics papers submitted to Physical Review Letters and to Physical Review E since 1993.

expertise to help maintain the quality of the journals, The Physical Review has initiated a program to recognize “outstanding referees”

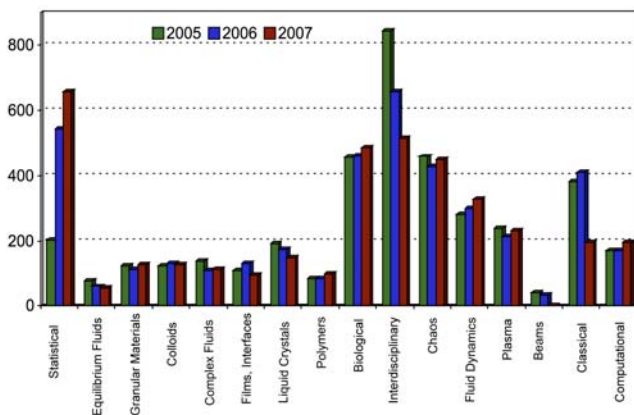


Fig. 2: Number of submissions to the various sections in Physical Review E for the past three years.

who have been exceptionally helpful in assessing manuscripts for publication in our journals. To begin the program, 534 referees were recognized in 2008. In the future, approximately 130 referees will be recognized each year.

Editors try to avoid overburdening referees. They appreciate suggestions from authors and from other referees for possible new referees. Submissions to the Physical Review journals continue to increase. Fig. 1 shows the increase in the number of biological physics papers

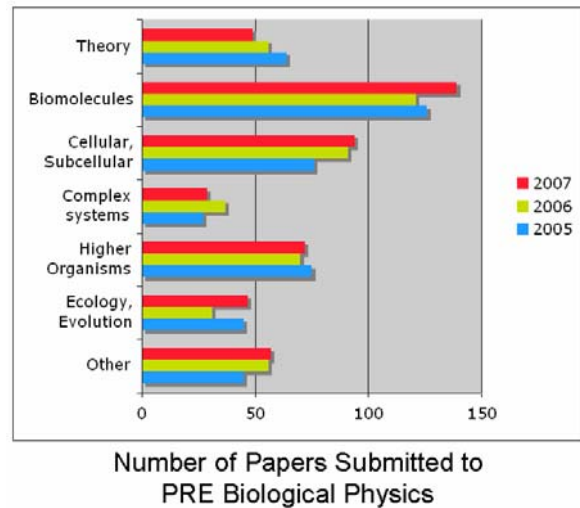


Fig. 3: Topics of papers submitted to the Biological Physics section of Physical Review E for the past three years.

submitted to Physical Review Letters and to Physical Review E since 1993. Fig. 2 shows the number of submissions to the various sections in Physical Review E for the past three years. Of the approximate 4000 papers submitted to PRE in 2007, about 490 were submitted to the Biological Physics section. The Biological Physics section includes papers in a number of subfields, including biomolecules, cellular and subcellular physics, complex systems, higher organisms, and ecology and evolution. This is illustrated in Fig. 3. Physical Review welcomes submission of biologically inspired physics papers. In PRE the median time for the first valid referee report is about 25 days, and the time from receipt to acceptance about 100 days. The acceptance rate is about 55% for PRE and about 35% for PRL.

Minutes of the DBP Business Meeting APS March Meeting, March 11, 2008

Prepared by Thomas Nordlund

Annual Business Meeting, Division of Biological Physics, APS

Tuesday, March 11, 2008, 5:45-6:45 pm, New Orleans Convention Center, Room 208.

Light refreshments provided. 44 attendees signed in.

**Meeting Chair: Dean Astumian, DBP
Chair**

MINUTES¹

1. Chair Astumian called meeting to order at 5:55 PM (approx.) and welcomed attendees.

2. Chair announced the 2008 Max Delbruck Biological Physics Prize (\$10K) recipient, Steven Block, Stanford University: "For his originality in the direct measurement of forces and motions in single biomolecular complexes undergoing the nucleoside triphosphate hydrolysis reactions that drive intracellular transport, cell motility, and DNA and RNA replication." (The Prize Symposium, "Gene Regulation", Session B7, was held Monday, March 10, 11:15-11:51 am.) The Prize has recently reached endowed status.

3. Shirley Chan, retiring DBP Secretary-Treasurer, provided reports and presented financial and membership data for 2007-2008.

¹ Minutes reconstructed by incoming Secretary-Treasurer, Tom Nordlund, after an unfortunate computer crash caused loss of the original meeting notes. Crucial information and review were provided by Shirley Chan, Dean Astumian and other members of the Executive Committee. Please send any corrections to nordlund@uab.edu.

Information is summarized below and is shown in detail on the following page.

- Financial reports for 2007 vs. 2006.
- Support for speakers (total \$4,910) and students (total \$4,000) in 2008.
- Report on DBP membership, profile and growth. Membership is now at (approx) 1881. Chan noted that DBP female membership is at about 15% and that its increase should remain a priority. The one-year free-membership drive should increase the overall membership.

Question addressed to Chan – What fraction of the APS membership is now in the DBP? Answer: about 4.1%. Note that the minimum requirement for a unit to become and stay as a Division is 3%.

4. The Chair presented highlights & initiatives in the year 2007-2008

- *Opportunities in Biological Physics* workshop was held the weekend before the March meeting, funded by the Agouron Foundation.
- Amendments to the DBP Bylaws have been approved: Bylaws Committee (Chan, Finegold, S-T 1976-80, Austin, Chair 2003, & Cole, APS); approved by the APS General Council and by DBP members (90% vote). Copies of the bylaws were made available to attendees. The driving force of S. Chan was noted in the success of this effort.
- A "free 1st-year DBP membership for new-comers" Membership Drive is being carried out, coordinated by

incoming DBP Chair James Glazier. Announcements are to be made at all DBP sessions, as well as in posters outside session rooms.

5. Presentation of 2007 Fellows sponsored by the DBP, with certificates and pins, were made. James De Yoreo, Jianpeng Ma, and Thomas Nordlund were present to receive their certificates. The remaining certificates will be mailed. The new 2007 Fellows are: Britton Chance, Gang Bao, Dante Chialvo, James De Yoreo, Marilyn Gunner, Carol Hall, Jianpeng Ma, Thomas Nordlund, Attila Szabo.

Because of some unusual circumstances, Chance's nomination was as an "APS General Fellow", rather than a DBP nominee. Discussion of encouraging new nominations for 2008 elections was made, especially in light of the overlooking of Britton Chance for many years. The remaining Fellows were DBP-sponsored.

6. Report from the 2008 Executive Committee Meeting.

- Shirley Chan, long-time Secretary-Treasurer of the Division (2004-2008) kept her campaign promise to reintroduce the DBP Student Travel Grants, to expand and manage the program consistently. The Executive Committee voted to name the travel grant after Shirley Chan.
- Filling Committee/subcommittee openings and vacancies is under way: Nominating, Fellowship, Program Committees.

- Judy Franz indicated the financial status of the APS is strong. The US Congressional budget for the physical sciences and engineering, in contrast, looks disastrous. Members should take the letter-writing campaign very seriously. Joe Serene reported to the Exec that much of the APS's financial strength is due to the success of the Society's publications.

7. Open discussion from DBP members on non-scientific business issues. James Glazier proposed the DBP consider a student thesis award.

8. Results of the 2008 election were announced: Vice-Chair: Herbert Levine; Secretary-Treasurer: Tom Nordlund; Members-at-Large: Daniel Cox and Timothy Newman. Chan noted that we again did not break the 400-vote "glass ceiling" among the DBP membership, in spite of the increase in membership. Astumian and Chan stated that increasing participation by the general membership should be one of the goals for 2008-9.

9. The new DBP Chair for 2008-9, James Glazier, was introduced by Astumian, and the meeting turned over to him. Glazier greeted the attendees.

After asking for any additional discussion, Glazier adjourned the meeting at 6:50 PM.

Submitted by Thomas Nordlund
Secretary-Treasurer
Division of Biological Physics

**APS Division of Biological Physics
2007 Financial Reports**

OPERATING FUNDS				WORKSHOP FUNDS			
	2006	2007	2007 Total		2006	2007	Total
INCOME				INCOME			
Member Count on 01/01	1783	1850		Registration fees	\$7,800.00	\$7,465.00	
Dues (@ \$5)	\$8,915.00	\$9,250.00		NSF Grant	\$3,350.00	\$0.00	
March Meeting Share	\$7,442.00	\$8,409.00		ICAM Grants	\$3,000.00	\$0.00	
Investment Earnings	\$3,230.49	\$3,961.19		IOP Contribution	\$1,500.00	\$0.00	
Agouron Foundation	\$25,000.00	\$0.00		Fluidigm Contribution	\$0.00	\$1,000.00	
Total Income	\$44,587.49	\$21,620.19	\$21,620.19	Total Income	\$15,650.00	\$8,465.00	\$8,465.00
EXPENSES				EXPENSES			
Dinner: Excom Mtg	\$1,268.19	\$971.63		Refreshments	\$5,130.00	\$5,566.08	
Rental: Projector/Video	\$352.00	\$0.00		Rental: Projector/Video	\$462.50	\$358.50	
Lunch: Students	\$0.00	\$0.00		Travel: Speakers	\$7,439.80	\$3,378.59	
Reception: Business Mtg	\$488.54	\$459.26		Travel: Organizers	\$1,434.07	\$1,758.43	
Reg. Waiver: Speakers	\$2,355.00	\$1,500.00		Postages	\$0.00	\$249.33	
Travel: Speakers	\$1,352.96	\$2,000.00		Poster & Printing	\$51.60	\$616.81	
Travel: Students	\$3,400.00	\$3,600.00		Credit Card Charge	\$148.50	\$0.00	
Travel: Sorters & others	\$1,692.78	\$1,864.84		Total Expenses	\$14,666.47	\$11,927.74	-\$11,927.74
Lobbying Fee to BPS	\$1,000.00	\$0.00		NET BALANCE	\$983.53		-\$3,462.74
Printing Fees	\$328.28	\$0.00		Agouron Fund Balance	\$25,000.00		\$22,520.79
Misc (postage, bank,....)	\$71.64	\$343.86					
Transfer to Prize Fund	\$25,000.00	\$0.00					
Total Expenses	\$37,309.39	\$10,739.59	-\$10,739.59				
Workshop Balance	\$983.53	-\$3,462.74	-\$3,462.74				
Previous Year Balance	\$48,084.52		\$56,346.15				
YR-END NET ASSETS	\$56,346.15		\$63,764.01				

Funds for Max Delbruck Prize in Biological Physics		
	2006	2007
ASSETS		
Restricted Fund Balance	\$5,631.66	\$77,280.97
Contributions:		
Anonymous	\$52,640.00	\$500.00
Hopfield's former Student	\$22,972.00	\$0.00
Investment Income	\$1,037.31	\$5,610.72
Designated Fund Balance	\$25,000.00	\$25,366.29
Investment Income	\$366.29	\$1,832.82
TOTAL ASSETS	\$107,647.26	\$110,590.80
EXPENSES		
Prize for Recipient	-\$5,000.00	\$0.00
YR-END NET ASSETS	\$102,647.26	\$110,590.80

Profile of DBP Membership, 01/01/2008			
Category		Percentage	
Sr/Life/Regular		62%	
Junior/Students		38%	
Total	1881	100%	
Gender		Percentage	
Male		81%	
Female		15%	
Unknown		4%	
Fellows	Number	Percentage of Total Members	Percentage of Each Gender
Male	250	13%	16%
Female	19	1%	7%
Total	269	14%	N/A

DBP Speaker	Session	Reg Fee Waived	Travel support	Institute	State or Country
Irina Mihalcescu	A7, full	\$305.00	\$700.00	University Joseph Fourier	France
Brian Haab	H16, Tue	\$195.00	\$300.00	Van Andel Institute	MI
Toshio Ando	P14, Wed	\$195.00	\$700.00	Kanazawa University	Japan
Chandra Yelleswarapu	Y7, full	\$305.00	\$0.00	U. of Mass	MA
Robert Birge	Y7, full	\$305.00	\$0.00	U. of Conn	Conn
Sukhdev Roy	Y7, full	\$305.00	\$1,200.00	Dayalbagh Edu. Institute	India
Martin Bier	L16	\$305.00	\$0.00	East Carolina U	NC
Julio Fernandez		\$305.00	\$0.00	Columbia, Biological Sci.	NY
Total charged to DBP		\$2,220.00	\$2,900.00		

DBP Student Travel Grants, 2008

First Name	Last Name	Grant	Institution, Department	City	State	Session
Svetlana *	Postnova	\$400	U Marburg, Physiology	Marburg	Germany	B16
Ross	Brody	\$250	U. Maine, Physics	Orono	ME	V17
Jessica *	Zimberlin	\$250	U Mass, Polymer S&E	Amherst	MA	P16
Yongxing	Guo +	\$200	Brown, Physics	Providence	RI	P16
Aphrodite	Ahmadi	\$250	Syracuse U, Physics	Syracuse	NY	X40
Chih-Kuan	Tung +	\$200	Princeton, Physics	Princeton	NJ	Y40
David	Liao	\$250	Princeton, Physics	Princeton	NJ	J16
Patrick	Hann	\$225	Rowan U, Physics	Franklinville	NJ	S16
Kun-Chun	Lee	\$225	U Penn, Phys & Astrophysics	Philadelphia	PA	L16
Chongzh	Zang	\$225	G. Washington U, Physics	Arlington	VA	W18
Matthew	Raum	\$225	Virg Tech, Physics	Blacksburg	VA	H16
Robert	Forties	\$150	Ohio State U, Physics	Columbus	OH	V40
Kevin	Johnson	\$150	U Mo-Columbia, Physics	West Plains	MO	B17
Nathan	Dees	\$150	U Mo-STL, Neurodynamics	St. Louis	MO	J17
Aonan	Tang	\$150	Indiana U, Physics	Bloomington	IN	B16
Ranjani	Narayanan	\$150	U FL, Physics	Gainesville	FL	D17
Yanxin	Liu +	\$150	Florida Intr'l, Physics	Miami	FL	D17
Xiaojia *	Tang	\$100	U GA, Physics	Athens	GA	D16
Lam	Nguyen	\$100	Florida SU, Physics	Tallahassee	FL	W25
Ronald	Benjamin	\$100	UAB, Physics	Birmingham	AL	L16
Allison *	Heath	\$100	U TX, Systems Biology	Houston	TX	D16

TOTAL \$4,000 (Male: 17, * Female: 4) (+ denotes repeated applicant)
All Domestic Students are required to serve 2 hours as "Arm-Twister" at Congressional Booth.

SPECIAL DBP ANNOUNCEMENT

LAST CALL FOR NOMINATIONS of DBP Members for 2008 APS Fellowship

On behalf of the 2008 DBP Fellowship Committee, this is to invite the nominations of some of your well-qualified colleagues to be considered for the elections to APS Fellowship this year. With 2008 membership count of 1881, the DBP will be permitted to sponsor up to 9 qualified candidates for the elections. Hence your attention for this process is most important so that the Division of Biological Physics can be better represented within the APS.

The instructions, criteria and forms for the nominations are available on APS website, <http://www.aps.org/programs/honors/fellowships/nominations.cfm>. All forms, the supporting information and recommendations for each nomination should be submitted electronically according to the instructions. New nominations for DBP-sponsored candidates and any updated information for the deferred candidates must be received by May 1, 2008, for the next reviewing cycle. The reviewing process is comprised of four stages. The final stage will end in mid- November at the APS Council Meeting. The announcements will be made by the APS Honors Program Office soon after the final conclusions. See the February 2008 newsletter for more details.

For any questions, please contact the Fellowship Office directly at e-mail: fellowship@aps.org, or telephone: (301) 209-3268.

Dr. Thomas Nordlund
Secretary-Treasurer
Division of Biological Physics

PRL HIGHLIGHTS

Soft Matter, Biological, &
Inter-disciplinary Physics Articles from

Physical Review Letters

8 February 2008

Vol 100, Number 5, Articles (05xxxx)

Articles published 2 Feb - 8 Feb 2008

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=5>

Swarming and Swirling in Self-Propelled Polar Granular Rods

Arshad Kudrolli, Geoffroy Lumay, Dmitri Volfson, and Lev S. Tsimring
Published 8 February 2008
058001

Sequence Dependence of DNA Translocation through a Nanopore

Kaifu Luo, Tapio Ala-Nissila, See-Chen Ying, and Aniket Bhattacharya
Published 5 February 2008
058101

Cascade of Complexity in Evolving Predator-Prey Dynamics

Nicholas Guttenberg and Nigel Goldenfeld
Published 5 February 2008
058102

Probing the Local Order of Single Phospholipid Membranes Using Grazing Incidence X-Ray Diffraction

C. E. Miller, J. Majewski, E. B. Watkins, D. J. Mulder, T. Gog, and T. L. Kuhl
Published 6 February 2008
058103

Cyclic Dominance and Biodiversity in Well-Mixed Populations

Jens Christian Claussen and Arne Traulsen
Published 7 February 2008
058104

Noise Enhanced Persistence in a Biochemical Regulatory Network with Feedback Control

Michael Assaf and Baruch Meerson
Published 8 February 2008
058105

Tightening of Knots in Proteins

Joanna I. Sułkowska, Piotr Sułkowski, P. Szymczak, and Marek Cieplak
Published 8 February 2008
058106

Hopping Conduction and Bacteria: Transport in Disordered Reaction-Diffusion Systems

Andrew R. Missel and Karin A. Dahmen
Published 4 February 2008
058301

Induced-Charge Electrophoresis of Metallo-dielectric Particles

Sumit Gangwal, Olivier J. Cayre, Martin Z. Bazant, and Orlin D. Velev
Published 4 February 2008
058302

Weighted Percolation on Directed Networks

Juan G. Restrepo, Edward Ott, and Brian R. Hunt
Published 4 February 2008
058701

Critical Networks Exhibit Maximal Information Diversity in Structure-Dynamics Relationships

Matti Nykter, Nathan D. Price, Antti Larjo, Tommi Aho, Stuart A. Kauffman, Olli Yli-Harja, and Ilya Shmulevich
Published 4 February 2008
058702

15 February 2008

Vol 100, Number 6, Articles (06xxxx)
Articles published 9 Feb - 15 Feb 2008

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=6>

Temperature Oscillations in a Compartmentalized Bidisperse Granular Gas

Meiyang Hou, Hongen Tu, Rui Liu, Yinchang Li, Kunquan Lu, Pik-Yin Lai, and C. K. Chan
Published 12 February 2008
068001

Orientalional Correlation and Velocity Distributions in Uniform Shear Flow of a Dilute Granular Gas

Bishakdatta Gayen and Meheboob Alam
Published 14 February 2008
068002

Nonlinear Study of Symmetry Breaking in Actin Gels: Implications for Cellular Motility

Karin John, Philippe Peyla, Klaus Kassner, Jacques Prost, and Chaouqi Misbah
Published 11 February 2008
068101

Mechanisms and Dynamics of Protein Clustering on a Solid Surface

P. A. Mulheran, D. Pellenc, R. A. Bennett, R. J. Green, and M. Sperrin
Published 12 February 2008
068102

Scaling Laws of Single Polymer Dynamics near Attractive Surfaces

Debashish Mukherji, Guido Bartels, and Martin H. Müser
Published 11 February 2008
068301

Nucleation, Drift, and Decay of Phase Bubbles in Period-2 Oscillatory Wave Trains in a Reaction-Diffusion System

Jin-Sung Park, Sung-Jae Woo, Okyu Kwon, Tae Yun Kim, and Kyoung J. Lee
Published 13 February 2008
068302

Constant Strain Frequency Sweep Measurements on Granite Rock

Kristian C. E. Haller and Claes M. Hedberg

Published 13 February 2008
068501

22 February 2008

Vol 100, Number 7, Articles (07xxxx)
Articles published 16 Feb - 22 Feb 2008

<http://scitation.aip.org/dbt/dbt.jsp?KEY=PRLTAO&Volume=100&Issue=7>

Polymer Chain Swelling Induced by Dispersed Nanoparticles

Anish Tuteja, Phillip M. Duxbury, and Michael E. Mackay
Published 21 February 2008
077801

Flow, Ordering, and Jamming of Sheared Granular Suspensions

Denis S. Grebenkov, Massimo Pica Ciamarra, Mario Nicodemi, and Antonio Coniglio
Published 19 February 2008
078001

On the Brink of Jamming: Granular Convection in Densely Filled Containers

Frank Rietz and Ralf Stannarius
Published 20 February 2008
078002

Does the Chapman-Enskog Expansion for Sheared Granular Gases Converge?

Andrés Santos
Published 21 February 2008
078003

Shape Transition and Propulsive Force of an Elastic Rod Rotating in a Viscous Fluid

Bian Qian, Thomas R. Powers, and Kenneth S. Breuer
Published 19 February 2008
078101

Maximum Entropy Approach for Deducing Amino Acid Interactions in Proteins

Flavio Seno, Antonio Trovato, Jayanth R. Banavar, and Amos Maritan
Published 20 February 2008
078102

Direct Calculation from the Stress Tensor of the Lateral Surface Tension of Fluctuating Fluid Membranes

Jean-Baptiste Fournier and Camilla Barbetta
Published 21 February 2008
078103

**Self-Similarity of Complex Networks
and Hidden Metric Spaces**

M. Ángeles Serrano, Dmitri Krioukov, and
Marián Boguñá
Published 20 February 2008
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JOB AD

Physical Scientist Department of Energy

Description:

The Department of Energy, Office of Science, Office of Basic Energy Sciences, Materials Sciences & Engineering Division, is seeking a motivated and highly qualified individual to support energy related fundamental scientific research in materials sciences and engineering that support the energy mission needs and the Strategic Plan of the Department of Energy. There is currently an opening for Program Manager in Materials Chemistry and Biomolecular Materials. The position will have the responsibility to plan, coordinate, implement, and evaluate research programs in these fields on a national and international level.

Duties:

You will serve as a Program Manager, determining scientific focus and directions, preparing calls for proposals, organizing independent peer reviews, recommending funding allocations, organizing Principal Investigator meetings, serving as a liaison on committees, and monitoring scientific progress of the program. You will examine and ascertain pioneering research needs and opportunities against scientific and technological advances and of potential needs of DOE. You will develop and prepare analytical documents to communicate with top management of DOE and higher echelons of government. You will select and ascertain the qualifications and suitability of peer reviews for proposed programs.

For more information:

Links to the Job Description may be found at the BES Jobs web page: <http://www.sc.doe.gov/bes/BESjobs.html>
Alternately, you may access the information directly from the USAJOBS site: <http://jobsearch.usajobs.gov/ftva.asp?seeker=1&JobID=69867656>

For additional information or questions, please contact:

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Web: http://www.science.doe.gov/bes/dms/Staff_Contacts/Kini.htm

JOB AD

POSTDOCTORAL POSITION IBM WATSON RESEARCH CENTER

A postdoc position is available immediately at IBM Watson Research Center (Yorktown Heights) in Dr. Yuhai Tu's group. We are looking for someone with strong background in physics (statistical, soft matter, nonlinear dynamics, etc.) and who is interested in working on biological problems. Specific subjects include studying complex biological networks, quantitative modeling of signaling pathways and molecular level understanding of biological devices, such as motors and switches.

Interested candidates should contact the PI (Yuhai@us.ibm.com) directly with their CV and 3 letters of recommendation.

JOB AD

POSTDOCTORAL POSITION MD ANDERSON CANCER CENTER

Applications are invited for a postdoctoral fellow position in the Department of Radiation Physics of the University of Texas (UT) MD Anderson Cancer Center to work on an exploratory research program on multiscale modeling of radiation response of biological systems. The position involves the development and application of computational methods for the modeling of the processes involved in the interaction of radiation with biological systems across different spatial and temporal scales. A good background in simulation and modeling of condensed matter or biological systems, interest in computational biological physics, experience in scientific programming, and high level of motivation for independent work is desired. Due to the interdisciplinary nature of the research, applications from candidates in all areas of computational science/engineering with interest in biomedical physics will be considered.

UT MD Anderson Cancer Center is renowned for its excellence in patient care, research and education programs. The candidates will have ample opportunities for interdisciplinary training to pursue an academic career in biomedical physics. Although it is primarily a research position, there will be opportunity to receive training in clinical medical physics. Interested candidates should send application materials by email to Ms. Cynthia M. Wyche (e-mail address: cmwyche@mdanderson.org). The application materials should include:

1. A letter of interest and current CV with names and contact information of at least two references;
2. An optional brief (no more than three pages) research proposal in the area of computation radiation biophysics that they would love to pursue.

The initial appointment will be for one year with possibility of renewals based on progress and availability of funds. UT M.D. Anderson Cancer Center is a smoke free environment. We are an equal opportunity employer and we encourage qualified women and minority applicants. Applicants must be legally eligible to work in the United States.

JOB AD

Program Managers Department of Energy

Job Opportunities: Program Managers for Photosynthetic Systems and Physical Biosciences

The Office of Basic Energy Sciences (<http://www.sc.doe.gov/bes/bes.html>), Office of Science, US Department of Energy, is seeking qualified applicants for two career federal positions managing either the Photosynthetic Systems Program or the Physical Biosciences Program. Both programs fund mission-oriented, basic science on plant and non-medical microbial systems at universities and national laboratories.

The Photosynthetic Systems Program supports fundamental research on the biological conversion of solar energy into chemically stored forms of energy. This entails studies on light harvesting, exciton transfer, charge separation, transfer of reductant to carbon dioxide, as well as the biochemistry of carbon fixation and carbon storage. Areas where biological sciences intersect heavily with energy-relevant chemical sciences and physics, such as in self-assembly of nanoscale components, efficient photon capture and charge separation, predictive design of catalysts, and self-repairing systems, are accentuated.

The Physical Biosciences Program combines experimental and computational tools from the physical sciences with biochemistry and molecular biology. The interdisciplinary approach provides a fundamental understanding of the complex processes that convert and store energy in living systems. Research supported includes studies that investigate the mechanisms by which energy transduction systems are assembled and maintained, the processes that regulate energy-relevant chemical reactions within the cell, the underlying biochemical and biophysical principals that determine the architecture of biopolymers and the plant cell wall, and active site protein chemistry that provides a basis for highly selective and efficient bioinspired catalysts.

Announcements and on-line application instructions can be found via the BES website:

<http://www.sc.doe.gov/bes/BESjobs.html> or directly at USA

Jobs: <http://jobsearch.usajobs.gov/ftva.asp?seeker=1&JobID=69368527> .

Applications must be submitted on or before May 9, 2008.

The complementary Photosynthetic System and Physical Biosciences Programs are described at: <http://www.sc.doe.gov/bes/eb/ebhome.html>. These programs also intersect with other research programs of the BES Division of Chemical Sciences, Geosciences, and Biosciences Division, described at <http://www.sc.doe.gov/bes/chm/chmhome.html>.


For questions about this position and working at BES, please contact Richard Greene, richard.greene@science.doe.gov or Eric Rohlifing, eric.rohlifing@science.doe.gov .

Training Workshop

Developing Multi-Cell Developmental and Biomedical Simulations with CompuCell3D

June 16th-20th 2008

Indiana University, Biocomplexity Institute, Bloomington, IN
USA



Background: Modeling is becoming an integral part of contemporary bioscience. The Glazier-Graner-Hogeweg (GGH) model as implemented in the modeling environment, CompuCell3D allows researchers to rapidly build complex models of multi-cell processes in development and disease with user-selectable resolution, from sub-cellular compartmental models to continuum models of tissues. CompuCell3D's use of CC3D-ML, BioLogo and Python model-specification allows compact description of models for publication, validation and sharing. CompuCell3D is open source, allowing users to extend, improve, validate, modify and share the core software. For more information on the GGH and CompuCell3D, please visit: <http://www.compuCell3d.org/>

Goal: By the end of the week, participants will have implemented a basic simulation of the particular biological problem they work on. Post-course support and collaboration will be available to continue simulation development.

Topics: Introduction to GGH modeling. Applications of GGH modeling and overview of published work. Introduction to CompuCell3D. Python and BioLogo scripting. Basics of model building. Extending CompuCell3D. Building a basic simulation of your system.

Format: The workshop will consist of a limited number of lectures and extended hands-on computer tutorials.

Instructors: James A. Glazier, Maciej Swat, Benjamin Zaitlen, Abbas Shirinifard, Nikodem Poplawski, Randy Heiland (Biocomplexity Institute, Indiana University)

Target Audience: Experimental Biologists, Medical Scientists, Biophysicists, Mathematical Biologists and Computational Biologists from advanced undergraduates to senior faculty, who have an interest in developing multi-cell computational models, or learning how such models might help their research. No specific programming or mathematical experience is required, though familiarity with some modeling environment (e.g. Mathematica[®], Maple[®], Matlab[®]) and how to represent basic concepts like diffusion and chemical reactions mathematically, would be helpful.

Fees and Support: The basic registration fee of \$500 will cover workshop participation, workshop materials and lunches. Partial support for registration, travel and hotel costs may be available.

Application and Registration: Enrollment is limited and by application only. To apply, please send a c.v., a brief statement of your current research interests and of the specific problem you would like to model. Students and postdocs should also include a letter of support from their current advisor. If travel support is being requested, please include a statement documenting need and amounts requested. Please submit all application materials electronically to Maciej Swat (mawat@indiana.edu) by May 15th, 2008.

Facilities: Participants will have access to an OSX cluster and will be able to connect to the Internet using their own laptops.

For More Information, Please Contact: Maciej Swat (mawat@indiana.edu).

Or visit: <http://www.compuCell3d.org>

